INVERTIBLE FUNCTIONS

1. In each case, explain or verify that the given function is invertible. Find the inverse function.

A. \[
\begin{array}{c|ccccc}
  m   & 1   & 2   & 3   & 4   & 5   \\
  f(m) & 0.09 & 2.10 & 5.60 & 7.80 & 9.40 \\
\end{array}
\]

B. \[S(t) = At^3 + K\] where \(A\) and \(K\) are constants.

C. 

2. The life expectancy, \(L\), of a child can be expressed as a function of the year of birth, \(y\) .
\[L(y) = \frac{y + 66.94}{0.01y + 1}\] where \(y = 0\) corresponds to 1950. Use the graph of \(L(y)\) to estimate \(L^{-1}(76)\).
Include a practical interpretation of your answer.

3. Determine if the following functions are invertible. Give reasons for your answers.

A. \(f(d)\) is the amount of sales tax on an item of clothing that sells for \(d\) dollars.

B. \(g(t)\) is the number of students waiting in line at the UA Catcard Office on the first day of classes as a function of time (since the office opened that morning).

C. \(h(x) = x + \cos x\)

4. What families of functions are invertible? Are all members of that family invertible or are there exceptions?